

CLAIMS

1. A drive apparatus for performing a sequential recording for a write-once recording medium, wherein

- the write-once recording medium includes a data area and a disc management information area,
- the data area includes a spare area and a user data area,
- disc management information for managing the write-once recording medium is recorded in the disc management information area,
- a plurality of physical addresses are assigned to the data area,
- a plurality of logical addresses are assigned to the user data area,
- at least one track is allocated in the user data area,
- the disc management information includes track management information for managing the at least one track, and
- the track management information includes a last recorded address indicating a location at which data is last recorded in a track,

the drive apparatus comprising:

- a recording/reproduction section for performing a recording operation or a reproduction operation for the write-once recording medium; and
- a drive control section for controlling the recording/reproduction section,

wherein the drive control section performs a process including:

- reading the disc management information from the disc management information area;

determining a primary logical address-physical address mapping indicating a corresponding relationship between the plurality of logical addresses and the plurality of physical addresses based on the disc management information;

receiving a recording instruction including a logical address indicating location at which data is to be recorded;

translating the logical address included in the recording instruction into a physical address in accordance with the primary logical address-physical address mapping;

determining a track of the at least one track based on the physical address corresponding to the logical address included in the recording instruction and the track management information;

determining a physical address indicating a location at which data can be recorded next in the determined track as a next writable address, based on the last recorded address in the determined track;

comparing the physical address corresponding to the logical address included in the recording instruction with the next writable address;

when the physical address corresponding to the logical address included in the recording instruction is smaller than the next writable address, performing a process including:

controlling the recording/reproduction section to record the data at a specific location in the user data area, the specific location being a location other than the location indicated by the physical address corresponding to the logical address included in the recording instruction;

generating new disc management information including replacement management information for mapping the physical address corresponding to the

logical address included in the recording instruction to the physical address indicating the specific location and the last recorded address updated by recording of the data; and

controlling the recording/reproduction section to record the new disc management information in the disc management information area;

when the physical address corresponding to the logical address included in the recording instruction is equal to the next writable address, performing a process including:

controlling the recording/reproduction section to record the data at location indicated by the physical address corresponding to the logical address included in the recording instruction;

generating new disc management information including the last recorded address updated by recording of the data; and

controlling the recording/reproduction section to record the new disc management information in the disc management information area.

2. A drive apparatus according to claim 1, wherein:

the write-once recording medium includes a plurality of ECC clusters,

each of the plurality of ECC clusters includes a plurality of sectors,

the plurality of physical addresses are assigned to the plurality of sectors,

and

the next writable address is an physical address of a first sector included in an ECC cluster next to an ECC cluster including the last recorded address.

3. A drive apparatus according to claim 1, wherein:

the determined track is an open track, and

the specific location in the user data area is determined as a location indicated by a next writable address in the determined track.

4. A drive apparatus according to claim 1, wherein:

the determined track is an open track,

the specific location in the user data area is determined as a location indicated by a next writable address in an open track which is different from the determined track,

the next writable address in the open track indicates a location which is closest to the location indicated by the physical address corresponding to the logical address included in the recording instruction.

5. A drive apparatus for reproducing data recorded in a write-once recording medium, wherein

the write-once recording medium includes a data area and a disc management information area,

the data area includes a spare area and a user data area,

disc management information for managing the write-once recording medium is recorded in the disc management information area,

a plurality of physical addresses are assigned to the data area,

a plurality of logical addresses are assigned to the user data area,

the disc management information includes a replacement management information list including a plurality of replacement management information,

each of the plurality of replacement management information maps a physical address indicating a location of the user data area to a separate physical address,

the drive apparatus comprising:

a recording/reproduction section for performing a recording operation or a reproduction operation for the write-once recording medium; and

a drive control section for controlling the recording/reproduction section,

wherein the drive control section performs a process including:

reading the disc management information from the disc management information area;

determining a primary logical address-physical address mapping indicating a corresponding relationship between the plurality of logical addresses and the plurality of physical addresses based on the disc management information;

receiving a reproduction instruction including a logical address indicating location at which data is to be reproduced;

translating the logical address included in the reproduction instruction into a physical address in accordance with the primary logical address-physical address mapping;

determining whether or not the physical address corresponding to the logical address included in the reproduction instruction is not mapped as an original location of a separate physical sector and it is mapped as a replacement location of a separate physical sector;

when it is determined that the physical address corresponding to the logical address included in the reproduction instruction is not mapped as an original location of a separate physical sector and it is mapped as a replacement location of a separate physical sector, outputting a predetermined data without reproducing data from the physical address corresponding to the logical address included in the reproduction instruction.

6. A drive apparatus according to claim 5, wherein:

the predetermined data is data reproduced from the physical address corresponding to the logical address included in the reproduction instruction.